Problem Based Master in Problem Based Learningin Engineering and Science at Aalborg University

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Master in Problem Based Learning in Engineering and Science (MPBL)

Introduction

The MPBL program aims at qualifying teaching staff from engineering institutions to develop their teaching practice through transformation from teacher-centred to student-centred pedagogy, such as, for example, problem-based learning.

The MPBL is a two-year part-time program (60 ECTS) structured in four modules. The program is an international and interdisciplinary, technology supported, distance learning program. The MPBL is offered by the UNESCO Chair of Problem Based Learning in Engineering Education, Aalborg University and developed in collaboration with international partners. Development has been partly financed by the SOCRATES-programme.

Outline

The program encompasses three types of study activities: Project work, project courses (P-courses) and study courses (S-courses). The program outline is shown in figure 1.

The MPBL program has been designed so as to be exemplary for its own contents, i.e. it is problem based and project organized. Participants work in teams of 2 to 4, with educational experiments aiming at solving problems located within their own teaching practice. In the project work they draw upon a range of different learning resources.

An Example

In Module 2 a group of three participants: one from Saudi Arabia and two from Australia, agreed to do a project with the title 'Learning to Solve Design Problems in Engineering Education' in which they formulated an analytical framework which provided a basis for designing three different teaching experiments in engineering design. At the end of the 5 month long project period the team submitted a 60 page project report plus 10 pages of process analysis.

	Project	P-courses	S-course
Module 1	Teaching Portfolio	• Learning Theories for Eng. & Sc. • Engineering Didactics	PBL Models in Eng. & Sc.
Module 2	Planning of educational experiment	• Development of Process Competencies • Scientific Methods in Engineering • Research Methods	Intercultural Learning and PBL
Module 3	Implementation of educational experiment	• Evaluation and Quality Development of Eng. & Sc. Education • Strategies for Management of Pedagogical Development • Engineering Competences in a Global Information Society	Project Supervision
Module 4	Reflection and Evaluation - final Master thesis		

Figure1: The MPBL program outline.

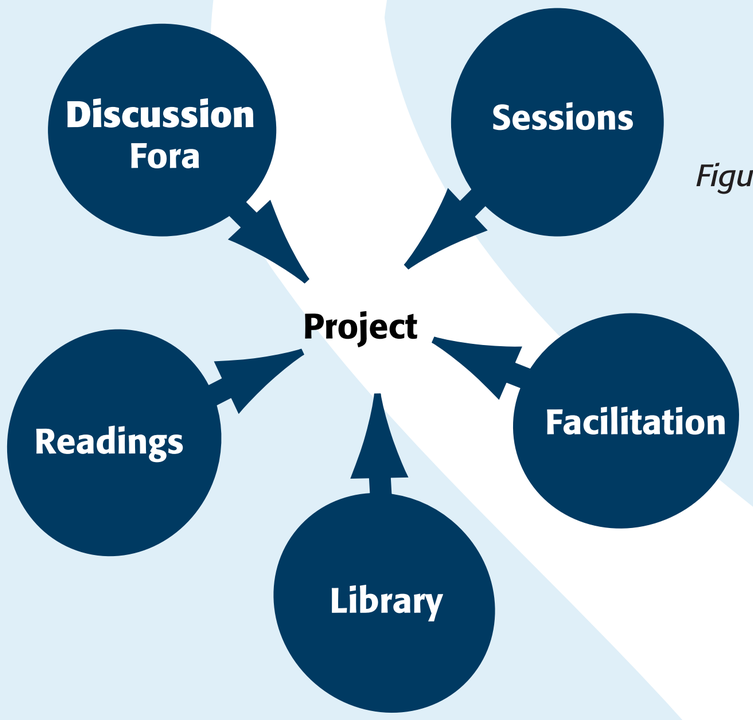

Figure 2: Learning resources for a problem based project

Participants' views

'... I learned so much about cultural diversity and the role of culture in teaching and learning environment.'

'This course made it possible for me to become the lecturer I really want to be! It made me realise what a bad lecturer I am!'

'It has broadened my mind and my thinking so much!'

Lessons learned

Securing a high level of on-line activity involving all participants requires ongoing effort and insistency from staff members.

Timing of synchronous communication via Skype is a challenge overcome by agreeing on dates and times for Skype meetings throughout the module at an early point in time.

Conclusion

The combination of PBL and on-line learning offers a new and flexible learning space, where technology is used to support a new and innovative form of interactive learning. However, experiences are still very limited. More research and further development is needed.

More information about the MPBL programme here: http://www.mpbl.aau.dk/